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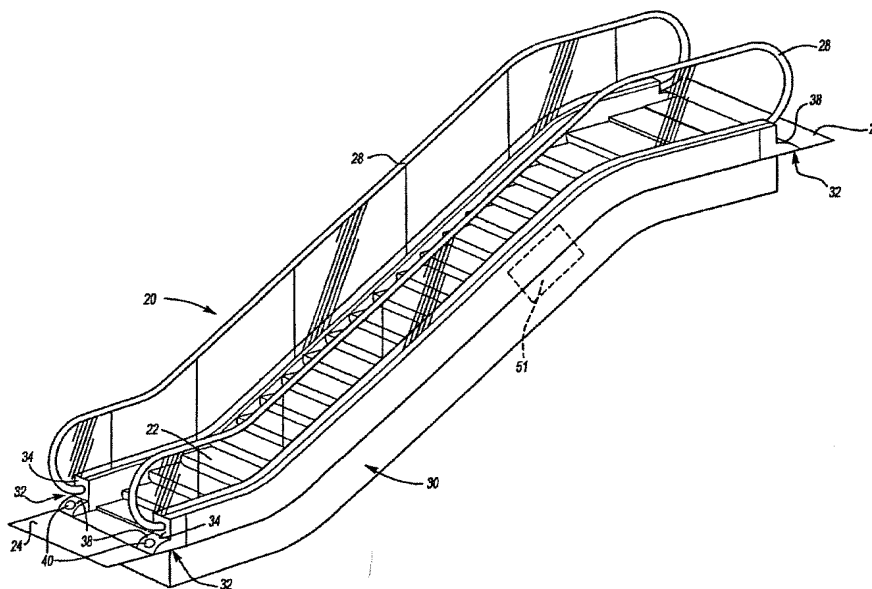
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(54) Title: **TRAFFIC FLOW INDICATOR FOR A PASSENGER CONVEYOR**



(57) Abstract: A display device (40) for use with a passenger conveyor (20) provides traffic flow direction information. One example includes a display panel (42) supported on a surface (38) that is conveniently positioned beneath the handrail (28) near a landing (24). In a particular example, a handrail entry module (32) includes a handrail entry (36) and a support surface (38) that supports the display (40). In one example, the surface (38) extends down and out from a vertical surface (34) associated with the handrail entry (36) to maximize visibility of the display.

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TRAFFIC FLOW INDICATOR FOR A PASSENGER CONVEYOR

1. Field of the Invention.

This invention generally relates to displays for passenger conveyors. More particularly, this invention relates to a traffic flow indicator display for a passenger conveyor.

2. Description of the Related Art.

Passenger conveyors, such as escalators and moving walkways, typically include a plurality of steps that move along a selected path between landings. In the case of escalators, the steps move in an upward or downward direction to carry passengers between different levels within a building, for example.

It has been desirable to provide a visible indication of the direction of movement of a passenger conveyor to approaching passengers. One approach has been to include visible markings on the outer decking beneath the balustrade associated with the handrail. This approach has been used where the balustrades are not clear. Another approach has been to include the visible marking on the outside of a glass balustrade. A shortcoming to either of these approaches is that they are visible only to passengers approaching the escalator from a straight-on direction. Such indicators may be visible at other particular angles but only from limited vantage points.

Another type of indicator provided previously was to include a post or sign external to the escalator indicating a direction of traffic flow. A shortcoming of such signs is that they are not on any portion of the escalator system and can prove inconvenient to business owners, for example, who are trying to maximize their use of floor space.

There is a need for an improved display to provide individuals a visible indication of the direction of traffic flow of a passenger conveyor, such as an escalator. This invention addresses that need while avoiding the shortcomings and drawbacks of prior approaches.

SUMMARY OF THE INVENTION

In general terms, this invention is a display that provides traffic flow information indicating a direction of movement of a passenger conveyor.

One example device for indicating the direction of movement of a passenger conveyor, designed according to this invention, includes a display that is adapted to be placed beneath a handrail near a landing at one end of the conveyor. The display is visible to an individual approaching the end of the conveyor.

In one example, the display is supported on a handrail entry module that includes at least one surface that is at least partially at an oblique angle relative to the landing. The display is supported on the obliquely oriented surface to maximize the visibility of the display to a wider variety of approaching passengers.

One example arrangement includes a controller that controls the contents of the display automatically to correspond to a direction of movement of the conveyor. In one example the controller uses information regarding a direction of movement of a motor that is associated with the passenger conveyor to propel the steps in a desired direction.

The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description of the currently preferred embodiment. The drawings that accompany the detailed description can be briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 schematically illustrates a passenger conveyor system incorporating a display designed according to an embodiment of this invention.

Figure 2 diagrammatically illustrates an example display arrangement designed according to an embodiment of this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in Figure 1, a passenger conveyor 20 includes a plurality of steps 22 that move in a selected direction between landings 24 and 26. The illustrated conveyor is an escalator, however, this invention is not limited only to escalators.

Moving walkways and other types of passenger conveyors are within the scope of this invention.

The steps 22 move in a conventional manner to carry passengers between the landings 24 and 26, which are at opposite ends of the escalator. A handrail 28 moves
5 in a conventional fashion with the steps 22 to provide a handle to stabilize passengers on the escalator. A conventional escalator support structure 30 at least partially covers over some of the operating components of the escalator system in a conventional manner.

Handrail entry modules 32 are positioned on opposite sides of the steps at each
10 landing. In this example, each module 32 includes a generally vertical surface 34 having an opening 36, which provides the handrail entry. A support surface 38 extends generally down and out from the vertical surface 34 between the corresponding landing and the vertical surface. In the illustrated example, the surface 38 is at least partially arranged at an oblique angle relative to the landing. In the
15 particular examples of Figures 2 and 3, the surface 38 is rounded or at least partially curvilinear. The position angles and shapes of the surfaces 34 and 36 can be varied to meet the needs of a particular situation. Given this description, those skilled in the art will be able to select what provides them an intended result.

A display 40 is supported by the module 32 and in this example is generally
20 aligned with the support surface 38. The display 40 provides a visible indication of the direction of traffic flow of the escalator. A variety of indicators may be provided on the display 40, depending on the selection of equipment to provide the display. One example indicator is an arrow pointing in the direction of traffic flow. Another example indicator is the word "UP" or the word "DOWN" indicating a direction of
25 escalator traffic flow. Other example indicators useful with a display designed according to this invention include a stop sign, a symbol indicating "no entry," a symbol indicating that an individual is entering a one-way street in the wrong direction or an "X" indicating that an escalator is not properly working and the steps are not moving. Those skilled in the art who have the benefit of this description will
30 be able to select the appropriate display contents to meet the needs of their particular situation.

Referring to Figure 2, a display panel 42 provides the visible indication of the traffic flow direction. In one example, the display panel 42 includes lights that are selectively powered to provide the desired traffic flow indication. LED's are used in one example. Another example includes a liquid crystal display panel. A variety of commercially available displays can be incorporated into a device designed according to this invention. Given this description, those skilled in the art will be able to select appropriate components to meet the needs of their particular situation.

Although the illustrated example includes the display 40 as part of the handrail entry module 32, this invention is not necessarily limited to such an integrated arrangement. Other embodiments that place the display beneath the handrail near a landing are within the scope of this invention. In one example, the display is supported by a structural member that is part of the landing.

As schematically shown in Figure 2, an electronic control unit 50 controls the display 40. In one example, a dedicated microprocessor is provided to control the contents of the display 40. In another example, the controller 50 is part of a controller associated with the machine (i.e., motor and brake schematically shown at 51 in Figure 1) that is responsible for controlling the movement or operation of the escalator. The controller 50 sends appropriate signals to the display 40 so that the desired display is provided. The controller 50, for example, provides an indication of the traffic flow direction based upon information determined regarding movement of the motor.

One advantage of this invention is that it places the traffic flow indicator display 40 near the handrail entry point 36. Providing a display of traffic flow information beneath the handrail at the landing makes the indicator more readily visible to a wider variety of potential passengers. Such a display is more readily visible from a variety of angles and more readily interpreted as providing a direct indication of the direction of flow or movement of the steps 22. This invention allows for integrating a traffic flow display into an elevator system in a manner that is aesthetically pleasing and provides higher functionality than previous attempts.

The preceding description is exemplary rather than limiting in nature. Variations and modifications to the disclosed examples may become apparent to those skilled in the art that do not necessarily depart from the essence of this invention. The

scope of legal protection given to this invention can only be determined by studying the following claims.

CLAIMS

We claim:

1. A device for indicating a direction of movement of a passenger conveyor, comprising:
5 a display that is adapted to be placed beneath a handrail near a landing at one end of the conveyor such that the display is visible to an individual approaching the end of the conveyor.
2. The device of claim 1, wherein the display includes a display screen supported
10 on a surface that is at least partially at an oblique angle relative to the landing when the display is placed beneath the handrail.
3. The device of claim 1, wherein the display comprises an electronic display
15 panel.
4. The device of claim 3, wherein the display is lighted.
5. The device of claim 3, wherein the display comprises a liquid crystal display
20 panel.
6. The device of claim 1, including a controller that controls an indicator on the
display and wherein the controller automatically sets the indicator to correspond to a
direction of movement of the conveyor.
- 25 7. The device of claim 6, wherein the controller uses information regarding a
direction of movement of a motor of the conveyor to determine the corresponding
indicator.
8. The device of claim 1, including a handrail entry module having a generally
30 vertical portion that has an opening through which the handrail passes and a support
surface extending generally down and away from the vertical portion and wherein the
display is positioned on the support surface.

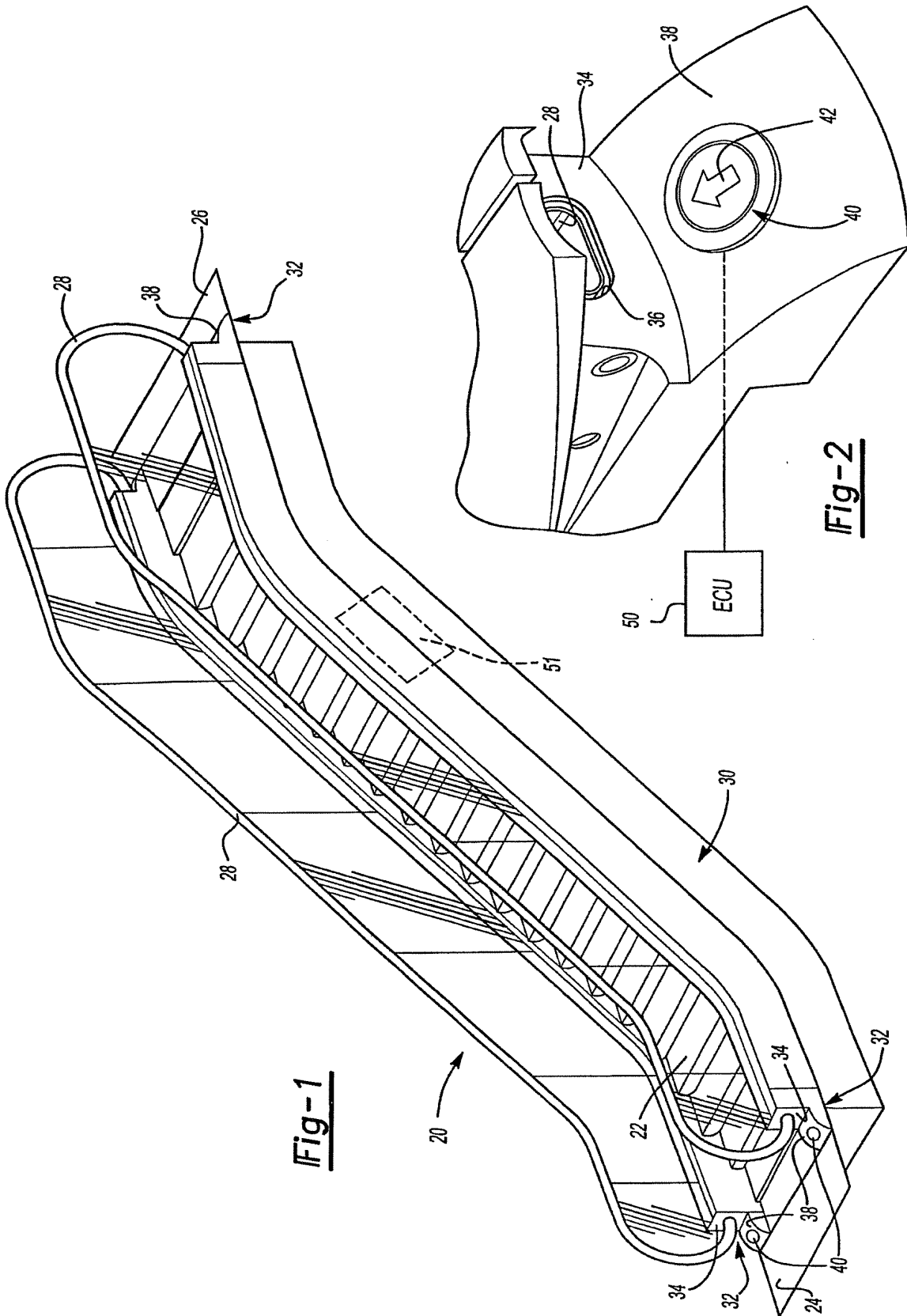
9. The device of claim 8, wherein the support surface is curved.

10. A passenger conveyor, comprising:
a plurality of steps that move along a selected path between two landings;
a handrail that moves with the steps;
at least one support surface positioned beneath the handrail near a
5 corresponding one of the landings; and
a display associated with the support surface such that the display is visible to
an individual approaching the landing, the display providing an indication of a
direction of movement of the steps.
- 10 11. The passenger conveyor of claim 10, including a handrail on each side of the
steps and a display beneath each handrail near each landing.
12. The passenger conveyor of claim 10, wherein the support surface is at least
partially at an oblique angle relative to the landing and the display is supported on the
15 surface.
13. The passenger conveyor of claim 10, including a handrail entry module that
includes a generally vertical portion that has an opening through which the handrail
passes and wherein the support surface extends generally down and away from the
20 vertical portion and wherein the display is positioned on the support surface.
14. The passenger conveyor of claim 13, wherein the support surface is curved.
15. The passenger conveyor of claim 10, wherein the display comprises an
25 electrically powered indicator.
16. The passenger conveyor of claim 15, wherein the display is selectively at least
partially lit to provide the indication of the direction of step movement.
- 30 17. The passenger conveyor of claim 15, wherein the display comprises a liquid
crystal display panel.

18. The passenger conveyor of claim 10, including a controller that controls the indication on the display and wherein the controller automatically sets the indication to correspond to a direction of movement of the steps.

5 19. The passenger conveyor of claim 18, including a machine that propels the steps in a selected direction and wherein the controller uses information regarding operation of the machine to determine the corresponding indication.

20. The passenger conveyor of claim 19, wherein the controller controls operation
10 of the machine and the display.



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 198/321

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, E	US 6,564,921 B1 (GORCZYCA) 20 MAY 2003.	ALL
A	US 5,923,005 A (BLONDIAU ET AL.) 13 JULY 1999.	ALL
A	US 5,782,330 A (MEHLERT ET AL.) 21 JULY 1998.	ALL

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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